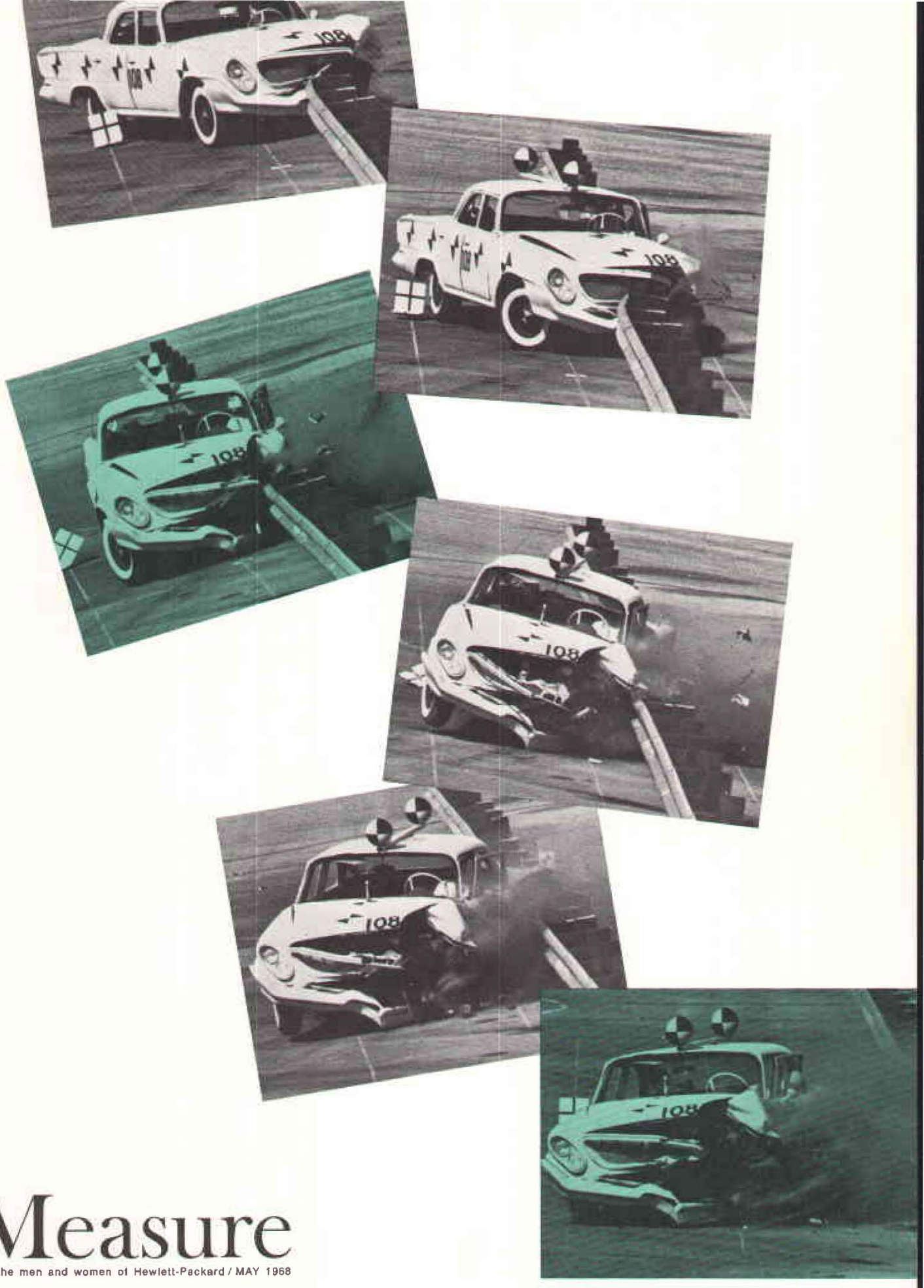


Measure

For the men and women of Hewlett-Packard / MAY 1968

☐ The needle is touching 80. The car in front of you is a mere five feet away. To the left and right of you, inches away it seems, are other vehicles pacing you mile after mile. And as far as the eye can see the entire highway is a ribbon of densely packed automobiles flowing uniformly toward the distant city. Not one of them has a steering wheel.

"It's coming," a highway engineer told MEASURE. "The automated highway has got to come. We have to take the steering wheel and the control of traffic out of the hands of the individual driver.

"If we don't, the 50,000 people we are now killing each year on our highways will be just the curtain raiser to a huge disaster."

Actually, not just death but a way of life is involved. Growth rates in auto production indicate that in 25 years, more than 20 million new cars will be placed on the road each year—more than twice today's rate. The total number of vehicles on the road will rise from the present 100 million to well over 200 million. The consequence, according to William N. Lawrence of the University of Michigan, will be horrendous congestion that will lead to the gradual elimination of the car in urban centers — unless an alternative system can be found.

Professor Lawrence and his associates set out to test the electronic control of vehicles and found it not only technically feasible but also economically advisable to do so. Their major conclusion was that electronic control would permit tremendous numbers of vehicles to be packed into a given stretch of highway—bumper to bumper at high speeds. Safety through the elimination of human failings and forgetfulness would be enhanced tremendously, concluded.

But, even though they can appreciate the need for automated traffic controls 15 or 20 years off in the future, the nation's highway and traffic engineers have to wrestle with today's problems using today's proven methods and materials. Since they can't get the driver's hands off the wheel, they are trying to minimize his errors and the results of those errors by providing safer highways. A multi-billion-dollar nationwide research and engineering effort pegged largely to the Federal Highway Safety Act of 1966 is aimed at doing just that. In fact, states that do not undertake such safety programs can lose 10 percent of the funds they receive for Federal interstate highway construction.

Just what kinds of things are being done to make the roadways safer?

One prime example is a new program in California which the Division of Highways has named CURE—short for Clean Up the Roadside Environment. Sign poles that flip upward and out of the way when nudged by an auto bumper and light standards that shatter into harmless fragments when bashed by a careening vehicle are two of the newest products of CURE-type thinking.

"Our philosophy is simple," said State Highway Engineer John Legarra. "Since some people come to grief off the roadbed we are going to see if we can help them avoid catastrophe by making sure shoulders and the adjacent ro

(continu

AHEAD: the highway

Cover: Photo sequence shows radio-controlled test auto crashing at 60 mph into experimental highway median barrier. The test near Sacramento, California, measured performance of the barrier as well as effect of crash on car and driver. Critical nature of such testing is portrayed in picture at left: this barrier design forced auto in earlier test to roll and inflict injuries that would have been fatal to a real driver.

that forgives

Those glowing spots on the highway are the new-style lane marking which is making driving safer in a number of states. The raised white markers replace the traditional white line, can be seen clearly at night and in adverse weather conditions.

highway that forgives

Driver fell asleep, ran off the road and rammed pole. But under program named CURE (clean up roadside environment), pole or other hazards will be relocated, buffered or designed to break away on impact to reduce danger.

The coming era of the totally automated highway is beginning to show itself in a number of electronically instrumented traffic control systems now being used in and near large cities. Typical is this lane control installation in which monitor at left observes traffic on closed-circuit TV then automatically changes sign at right to give drivers warning well in advance.

sides are comparatively smooth and free of obstructions. [illegible]nt drivers can use this siding as a recovery area."

An important part of this approach is to surround all immovable obstacles, such as bridge supports, with guard railing capable of deflecting cars traveling at speeds up to 68 mph. And where traffic moving in opposite directions cannot be separated naturally by grade level or raised shoulders, then sturdy median barriers are a must. By design (as shown in the sequence on the cover page) the barriers are intended to prevent out-of-control cars from breaking through or somersaulting into the path of oncoming drivers, while at the same time reducing the tendency to disastrous rolling or tumbling after impact.

Other features of the "forgiving" highway include raised reflectors and ceramic buttons as lane markers. In some states these are making the old painted white line obsolete. Years of testing have proven the markers to be highly visible both night and day and during all types of weather conditions, and the rumble they create when crossed has had the effect of reducing lane changing by up to 40 percent. The rumble is also credited with awakening drivers who have tended to doze at the wheel.

Some of the traffic problems still facing many communities have already been previewed on such stretches as the New Jersey Turnpike, believed to be the most heavily traveled toll road in the world. Here, in the interests of safety, twelve lanes of "supermammoth" roadway will be "unitized" into four three-lane sections, each completely independent with its own system of on and off ramps.

Many larger cities are having to turn to more highly instrumented systems of traffic control, involving computer control of lighting and signals, television monitoring of peak-hour situations, automatic sensing devices that warn of fog and other weather hazards, and communications systems.

Though it does not represent a major market at the present time, the traffic industry and the agencies serving it are finding increasing needs and applications for HP products. The Materials and Research Department of California's Division of Highways, for example, recently installed two HP data acquisition systems mainly for use in structural design. Offhand this may seem unrelated to safety, yet advances in prestressed concrete structural design with which they are concerned permit much longer highway bridge spans. This, in turn, means roadways with fewer support columns—which eliminates troublesome obstructions and at the same time allows a more pleasing appearance and economy in design.

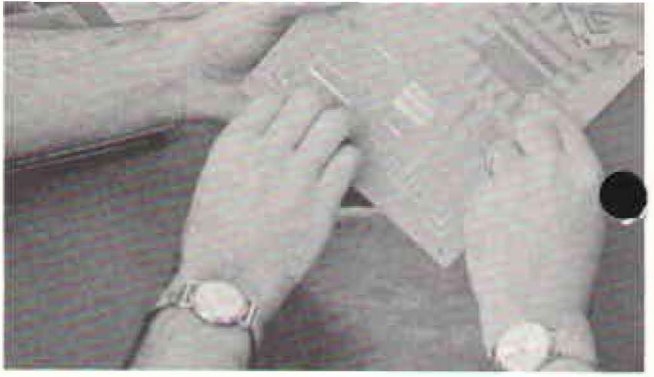
Other HP equipment at the Sacramento laboratory—somewhat representative of other highway and traffic research facilities—includes power supplies, a milliammeter, a high-speed digital scanner, electronic counters, and various voltmeter models.

Safety on the highway, of course, involves much more than roadway design. As Professor Lawrence noted, "The primary cause of congestion is not the number of automobiles, per se, but the fact that the driver does not have the information necessary to control his automobile in a manner which will increase traffic flow significantly." Or safely.

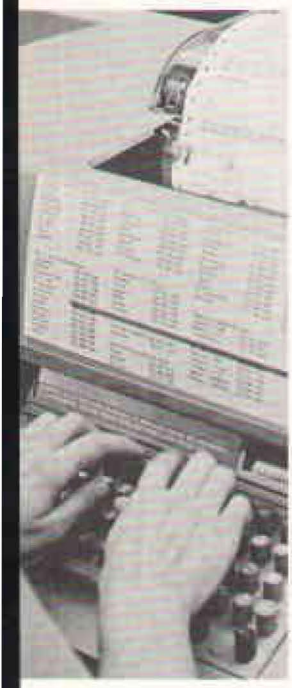
In the end, then, the "forgiving highway" will not be enough. It will be time for the computerized and electronically controlled highway that never forgets. □

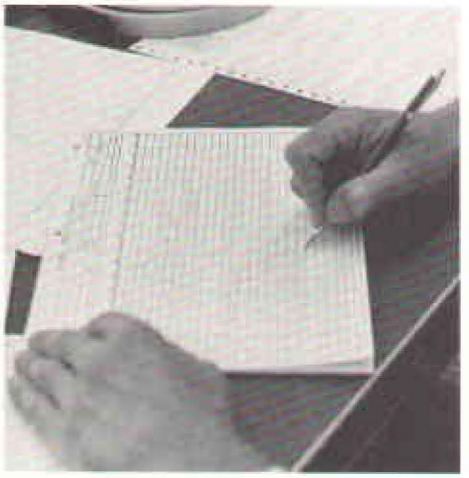
TARGET FOR '68

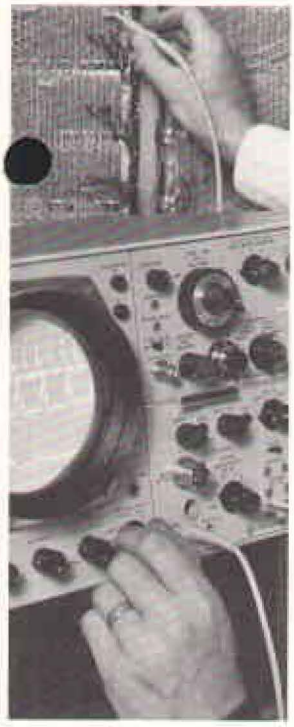
Reduce workmanship errors



...a customer







tells why

☐ "Excuse me just a minute," the customer said. "A moment of truth is at hand."

Speaking was Joe Rolfe, chief engineer of Micom, Inc., manufacturers of specialty electronic instruments used in evaluating high-performance magnetic tape equipment. The "truth" sought was the final plotting of test results involving a prototype instrument.

The plot was not quite to Rolfe's satisfaction.

"It might have been instrument error. Possibly a flaw in my test equipment that would be very hard to detect."

As he spoke, Rolfe motioned to his workbench. Most of the gear was HP—an electronic counter, digital voltmeter, AC voltmeter, test oscillator, distortion analyzer, oscilloscope, and a multipurpose meter.

"We're not big or rich, you know—not yet," Rolfe continued. "We have to give very careful consideration to everything we purchase. These instruments represent major investments for us. We can't afford to leave equipment idle for long, so we move it around from R&D to manufacturing — wherever it's most needed at the time.

"A failure can cause all kinds of expensive problems —late deliveries, production overtime, idle facilities and employees, delays in developing new products, loss of sales and so forth."

Up in the front offices of the two-year-old Palo Alto, California, firm, Micom Marketing Manager Dave Nelson made other points bearing on the reliability of the test instruments they buy:

"We depend on a dozen reps to sell our products. Getting good reps—especially for a young outfit like ours—hasn't been easy. They want to see profits without problems.

"We don't have service centers to take care of field problems. Instruments needing repair have to be shipped all the way back here.

"One of our principal products, a flutter meter, also goes out under the label of a leading tape products manufacturer. You can be sure they want no problems from us."

Finally, in the manufacturing area, Production Manager Emmett Doyle reviewed the stern testing procedures that Micom follows to insure quality. Notable was a final test in which all flutter meters are tested using a special modulator. The readings have to be identical:

"Consistency is absolutely essential. Our customers need to know they are getting the same results time after time. That's one of our main claims to success.

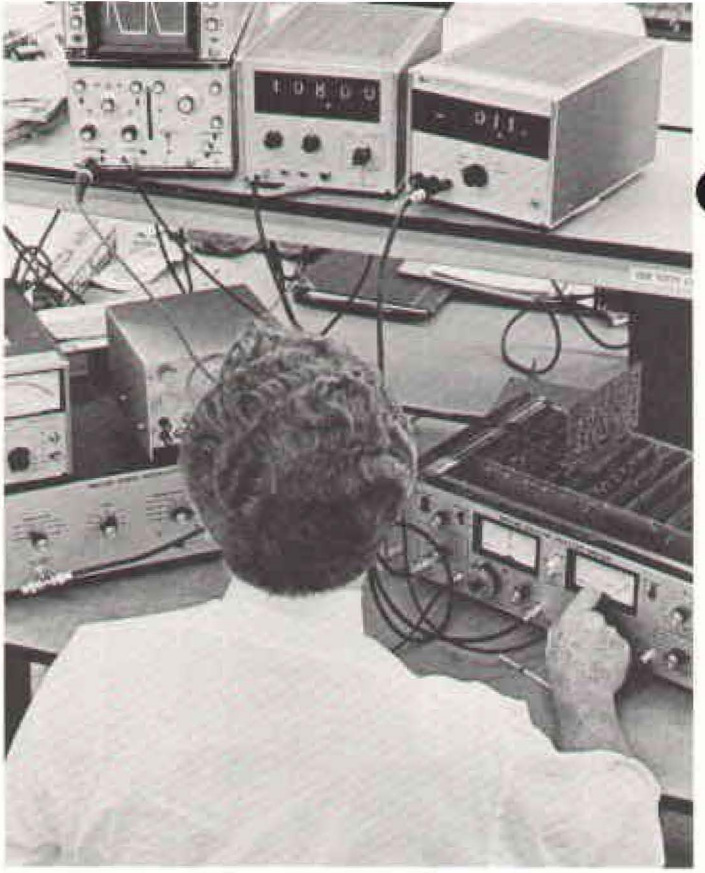
"As you can see, the reliability of the test instrumentation we use, including that of HP, cannot be overemphasized."

One thing is clear after talking with customers such as Micom: when they get into the subject of instrument

(continued)

To a young instrument firm building its reputation and sales, there's no substitute for quality, says Micom Marketing Manager Dave Nelson. Reliance on the performance of HP test instruments — and HP workmanship — is an important element in quality program.

customer tells why



Test instruments represent a major investment, according to Micom's Joe Rolfe, chief engineer, left above. Flaws and failures can be very expensive as firm keeps equipment in constant use wherever needed. At right, flutter meter goes through final procedure that must produce consistent results — again dependent on tests involving a number of HP instruments.

reliability and workmanship, they are not just thinking about the hardware. Their viewpoint is not limited to items that are covered by a product warranty. In their experience, the total package delivered by a supplier — from the time the order is placed to delivery and after-sale service—is representative of the workmanship involved. In one way or another, directly and indirectly, everyone in the Hewlett-Packard organization has a hand in creating that package.

To be a good package the customer's purchase order will reach the manufacturing division from the marketing office complete in all necessary details. There can be no little oversights—no two-dollar items left out of the instructions that will have to be corrected later, perhaps after the product is in the hands of the customer and causing him problems.

The customer will expect a well-designed instrument, and one that has been manufactured and tested with care.

Then there's packaging and shipping. Forgetting to include an instruction manual can create as much havoc for the customer as a missing part or a damaged circuit. The same situation arises if the manual is out of date, or not available at the time a new product is introduced.

Receipt of a bill is a customer's lot too, and it will really be a painful experience if there's been a billing error.

These particular stages in the process don't represent any special problem areas. They are used only as illustrations of the dozens of activities that make up the total package in the customer's mind. As Ralph Lee, vice president of operations-west, noted: "Everything is interrelated — engineering, manufacturing, marketing. Problems can arise from any job that either doesn't get done or isn't done well.

"Actually, when it comes to manufacturing workmanship, we are doing a better job these days. A year or so ago there were some specific problems in this area, mainly in divisions that were experiencing tremendous growth in employment and new products. Many of the new people lacked experience. This situation has improved. But it has only been brought about by continuing emphasis on training, on new manufacturing processes, new techniques in handling new materials, and improvements in communications. We have to keep this going.

"All of us can benefit and contribute by keeping the customer in mind—becoming more customer conscious—and by doing our job right, and doing it right the first time."

Doing the job right obviously pays off in customer satisfaction. Mostly this will show itself on the order books as satisfactory customer experience builds customer confidence. Sometimes it will be expressed more openly, as in the selection by Aerojet-General Corporation of HP as its "supplier of the month" for May. According to the letter advising of this honor, "it reflects a job well done over a long period of time . . . your organization has been extremely responsive . . . provided us with very high quality . . ."

How does the individual HP employee benefit? Doing a job right the first time—eliminating the need for expensive rework and other repetitious efforts—obviously will help hold the line against one segment of increasing costs that adversely affect profit margins and employee profit sharing in 1968.

There's everything to gain. □

News in brief

Tokyo — Y-HP on June 1 begins direct marketing of HP's medical instruments in Japan. The office will be headed by Toyoji Kakita.

Palo Alto — A new HP Systems group is being established to handle the sale and engineering of custom systems. The group will report to Jack Melchor, Palo Alto Division general manager. Dick Reynolds, currently HPSA managing director, will head the group; his staff will include Bob Grimm, marketing manager, and Jerry Collins, operations manager.

Palo Alto — Stock purchase price is $65.12 for the first quarter of calendar 1968 in the employees' stock purchase plan. Cost to the employee is $48.84, with the Company contributing the additional $16.28.

St. James, Manitoba — HP Canada this month will open its seventh Canadian sales office. To be located at 511 Bradford Street in this Winnipeg suburb and headed by David Gibbs, the office will handle the electronic and medical disciplines in the provinces of Manitoba and Saskatchewan.

Luanda, Angola—Telectra has been appointed distributor of HP electronic and chemical products in Angola, with headquarters in Luanda, the capital city. The firm is a branch of HP's distributor for the two lines in Portugal.

New York — An HP advertisement scored first in a readership survey that determined the most popular and best remembered ads in a recent issue of *Electronic Design*, a magazine published here by Hayden Publishing Company. The four-page, color ad heralded the Colorado Springs Division's new 181A variable-persistence oscilloscope.

Teheran — Telecom, Ltd., the company's distributor of electronic and medical instruments in Iran, added HP's analytical product line to its sales effort, effective May 1.

Azusa, California — HP has been named supplier of the month for May by Aerojet-General Corporation, headquartered here. Said Aerojet: "Although this award is related to a specific month, it reflects a job well done over a long period . . ."

People on the move

Corporate —George DeLannoy, to accounting staff, HP Labs, from accounts receivable supervisor, corporate Palo Alto finance; Pete Grady, to corporate Finance staff, from Palo Alto accounting manager; Greg Jordan, to order processing, corporate Marketing, from marketing systems, corporate Management Services; Brooks Lupien, to corporate Finance staff, from commercial administration, International Operations; Bob Puette, to order processing manager, corporate Marketing, from marketing systems, corporate Management Services; Swede Wild, to equal opportunity manager, corporate Personnel, from fabrication manager, Microwave Division.

F&T — Mike Massey, to product support specialist, F&T nuclear, from product training, corporate Marketing; Rudy Papiri, to general accounting manager, from accounting staff; Kurt Schmitz, to cost accounting manager, from accounting staff.

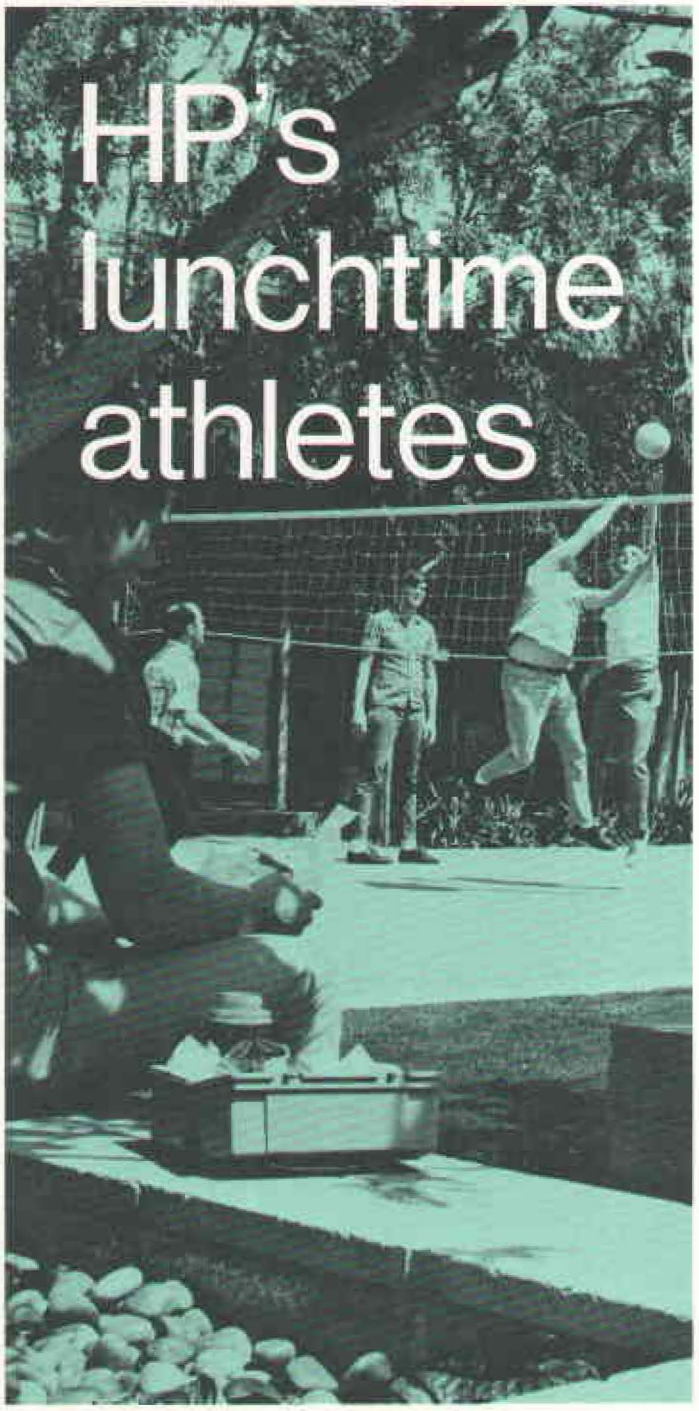
International — Will Carleton, to accounting staff, International Operations, from marketing systems, corporate Management Services; Erick Montoya, to chemical product specialist, HPIA, from training program, Avondale Division.

Microwave—George Kan, to materials engineering, from manufacturing services, Palo Alto Division; Vince Morgan to accounting staff, from corporate Palo Alto finance staff; Chuck Reichel, to accounting staff, from corporate Palo Alto finance staff.

Palo Alto — Hank Morgan, to cost accounting systems area, from billing and fixed assets, corporate Palo Alto finance.

Neely — Frank Holt, to staff engineer, Palo Alto, from marketing staff, Mountain View Division; Tom Smith, to staff engineer, Palo Alto, from repair staff, Customer Service Center.

HP's lunchtime athletes



Take the noon balloon to just about any HP location and there you will surely find someone giving it the old college try. The range of lunchtime athletic activities is quite amazing. An informal survey by MEASURE discovered organized programs of volleyball, frisbee, horseshoes, softball practice, tennis, rugby scrimmaging, table tennis, golf practice, shuffleboard, walking, tenipon (a Japanese version of tennis and ping-pong), and basketball. The picture at left, taken at the Stanford complex where volleyball is popular, captures some of the spirit of the occasion: people taking time out to relax in the fresh air and sunshine. For the players it's a good set they can spike to the ground. For the observers it's a leisurely lunch and free admission to the game.

And now a late report has come in advising of a group that takes a quick run during the morning coffee break.

Keep it up, fellows. We're behind you—far behind—all the way.

No, this is not a business conference. It's noon scrum practice for the Y-HP rugby team which competes in one of the strongest leagues in Japan. Team won championship in 1965.

Grooving the old glove at Avondale: Frank Pellippo bats grounders to Dale Odum, Duke Torello, Charlie Standifer, John Vaught, and Butch Perrotti.

The new Paramus, New Jersey, office is just getting under way with sports programs. One and only table gets a workout from partners Bill Daniels, left, and Jim Brockmeir.

Skill and cunning are the secret ingredients of this innocent looking game named shuffleboard. It's clobber or be clobbered, being put to the test here by Microwave's Helen Loucks, left, and Bert Sullivan.

Putting is the name of the game at Loveland Division. Dick Lubinski, right, waits for — oh, joy — ball to drop while Bob Ward takes the lesson. At left, Housemother Barb Schleiger sharpens her game.

There's a nice lilt to the name: Waltham Walking Club. Anyone can join, and many have. From left, founders Elaine Montague and Bette Hughes set pace for Ruth Sennett and Bernie Berard. Average is 20 minutes a day.

When customers go to Palo Alto for training or assistance in the use of HP chemical analytical instruments, they'll receive top professional help — and a nice surprise:

Swiss Miss with a mission

Helping a visitor, K. Nirmalan of Ceylon, acquire skill in GC sampling techniques represents one of the responsibilities of Annemarie Wegmann in new analytical instrument laboratory opened recently in HP corporate building.

Working with potential customers is main mission of training lab. Here Annemarie demonstrates HP research gas chromatograph for Stanford School of Medicine chemists, Dr. Bert Halpern, left, and Dr. John Westley.

☐ An industrial chemist and veteran in techniques of analyzing materials. A skier, alpine hiker, and world traveler. A marketing specialist with a positive and persuasive approach to business, and responsibility for demonstrating costly analytical equipment. A dedicated collector of rare rock crystals worth a small fortune.

Now there's an unusual gathering of talents, wouldn't you say?

And, indeed, it does represent the collective accomplishments of the staff of the newly-formed HP analytical instrument demonstration laboratory in Palo Alto. Only in this case the staff and the accomplishments belong to just one person—a pleasant Swiss miss named Annemarie Wegmann.

The laboratory is the latest of several such facilities established by the company to provide convenient centers for the demonstration of HP analytical instruments, particularly those of the Avondale Division, which serve the chemical industries.

Annemarie's lab is the first on the West Coast and has already received high praise from Neely medical/chemical marketing people.

As Ken Kleidon of the Neely-North Hollywood office pointed out, "It's almost impossible to set up a proper demonstration of a gas chromatograph anywhere but in a laboratory. You have to have a standardized temperature, and supplies of air, oxygen, and helium. And, with some versions of these instruments priced in the $10,000 range we will get much better mileage for our money having demo products in one place where they can be used every day.

"Annemarie will run tests of specific customer samples for us. Normally these are samples of materials that have not been analyzed before by gas chromatography. The customer wants to see if we can do it, and when we do, it builds interest in our products.

"We also arrange to have customers visit the lab so that Annemarie can demonstrate the instruments and train the visitors in GC techniques. It's great having someone in the lab who is so sales-conscious."

The lab, with its combination of technically demanding work and person-to-person contact, is an environment that appeals strongly to Annemarie.

"Customers are in here every day from all parts of the world. Their projects are very, very interesting to me."

A look at the visitors' log shows visitors from the Western United States, South America, and the Far East. Recently, for example, Miss Wegmann was visited by a young HP representative from Ceylon. One of his jobs is to work with firms that analyze the quality of tea grown on the hillsides of that island nation.

(continued)

Swiss Miss

Kanagaratnam Nirmalan, the Ceylon visitor, explained that in the past the flavor of tea has been a function of altitude.

"The higher it's grown, the better it tastes.

"Now they are learning to create atmospheric conditions in our lower-level tea processing plants similar to that experienced at the higher elevations. This has the effect of improving the flavor of the low-grown tea, and could be very important to our economy. Gas chromatography could be very useful in our research."

In terms of the comparatively short history of gas chromatography as an industrial tool, Annemarie's seven years in the analytical field give her a rating of at least a veteran, if not a pioneer. She entered the field in her home town of Zurich, Switzerland, shortly after graduating in chemistry at the local technical college.

Following graduation she was hired by a Swiss drug manufacturer, where she gained experience in thin layer chromatography. Annemarie introduced this technique into the U.S., then returned to Switzerland where she joined another firm, a pioneer European manufacturer of gas chromatography equipment. Here she advanced from applications chemist to training supervisor. About a year ago she left to join Stanford University. Late in 1967 she was invited to join HP and set up the new lab as a member of Carl Mahurin's corporate training group.

Annemarie looks on her work not just as a job to fill the day, but as a completely absorbing activity. She feels challenged by the problems that come to her from customers and field sales engineers. These help to keep her on her toes, chemically speaking, as does her membership in a chemical specialty organization at Stanford known as the "Peptides" group.

But the world is more than just a material in need of analysis. It's also skiing in the Swiss Alps, or mountain climbing in search of minerals in crystal form. Five years ago it was a three-month voyage around the world, achieved after several years of devoted money saving.

This year it is a visit to California by her widowed mother, a first such visit outside the borders of Switzerland and her first glimpse ever of an ocean beach and the sea.

Meanwhile, as a woman working in a technical field usually associated with men, Annemarie has found there are some special challenges to face. There's that supplier, for instance, who hasn't quite got the message that Annemarie means business when she asks for quick service. There's atomic absorption equipment due in for installation. There are demonstration appointments to be confirmed. A couple of samples coming in that just might be the key to a sale. A call to make to a chemist working in a petroleum research laboratory. A test to make for an HP researcher.

A day seems hardly long enough . . . □

Working with people and keeping up professionally in an exciting field of chemistry is the combination Annemarie finds most attractive in her HP role. At left she selects material for use in GC column being prepared at right. Gas chromatography permits detection of parts-per-million chemicals and impurities.

from the chairman's desk

For as long as there has been a Hewlett-Packard Company we have had a nondiscrimination policy applying to hiring, as well as to any subsequent personnel actions relating to employees. We enforce this policy not only because it is good business, but also because it is our responsibility as citizens.

We have put a great deal of emphasis on the importance of broadening employment opportunities for minority groups, and over the years we have seen considerable divisional activity in developing programs to train these groups and help them find worthwhile jobs. The programs go beyond any legal requirements. They are inspired not by government edict but by HP people who want to do something constructive about a pressing social and eonomic problem.

I think we can point to some substantial accomplishments down through the years, but even so we in HP have much yet to do to further our efforts in both hiring and upgrading people from the minority groups.

This urgency of doing more, and the need to convey the importance of equal opportunity to all our people, has led us to establish the position of a full-time corporate Equal Opportunities Manager, reporting to Ray Wilbur. This is an important function in that it will provide greater counsel and coordination of all equal opportunities programs throughout the company, and also serve as the source for the development and initiation of new ideas and concepts.

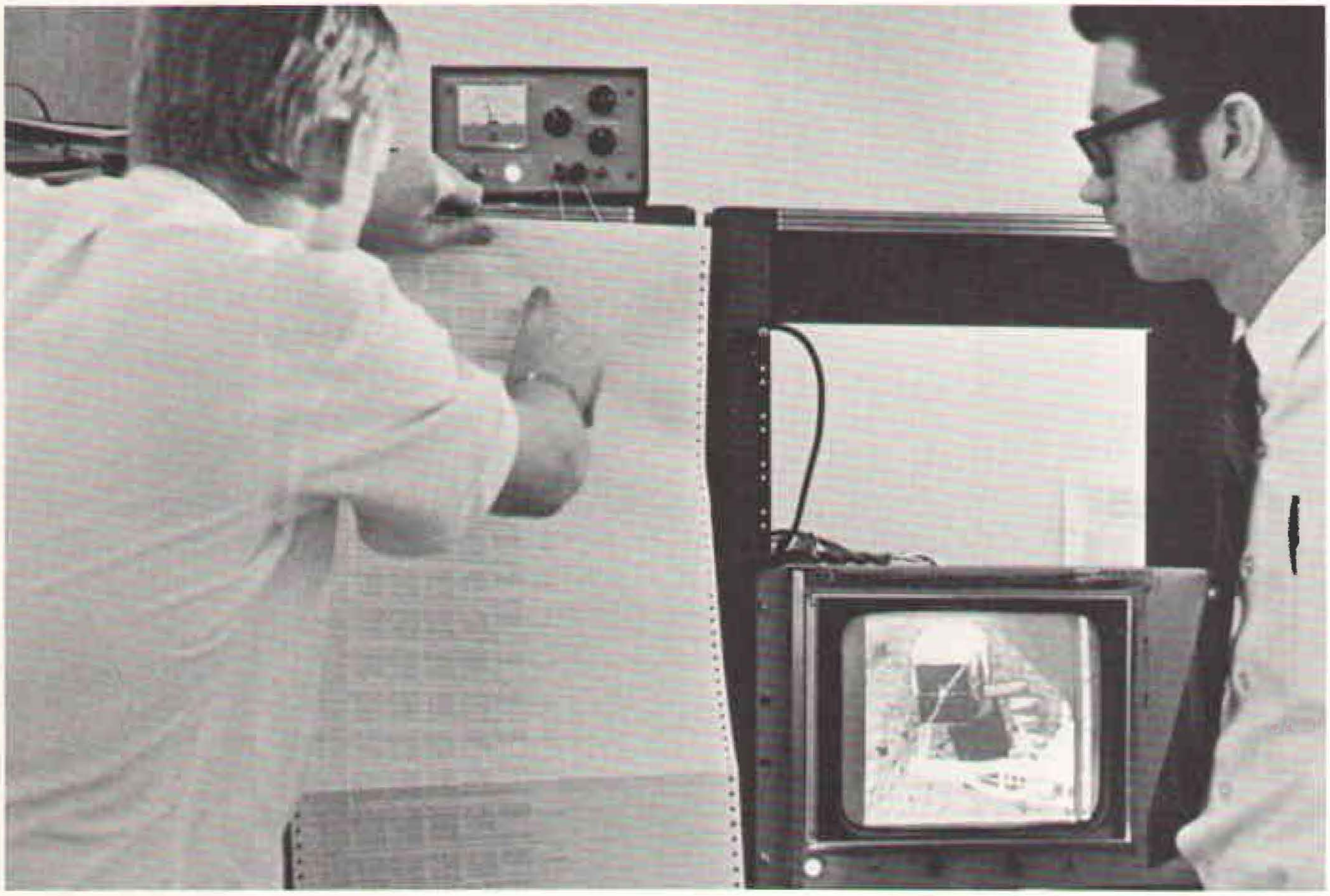
The Equal Opportunities Manager, among other things, will implement and monitor training and upgrading programs for members of minority groups; he will coordinate summer hiring of those in minority groups, assuring adequate assignments and counselors; he will draw up personnel relations courses relating to minority groups for managers and supervisors; he will play an active role in special recruiting efforts for full-time and part-time employment of the disadvantaged; and, he will provide liaison and coordination relations with groups outside of the company which have direct interests in the overall minority problems.

In addition, the Equal Opportunities Manager will have a number of assignments that relate specifically to our activities here in the San Francisco Bay area.

Harold (Swede) Wild has moved over from his job as Fabrication Manager for the Microwave Division in Palo Alto to fill this important new position. Swede has been with HP for nearly 25 years, and brings to the job not only a wealth of experience and ability, but a great personal interest as well.

However, if our company is to make any significant contributions in this area, it will take the efforts of many people—not just one, or a dozen, or even a hundred. Success can only come about if HP people everywhere make a sincere effort to understand and to assist whenever possible. Only through the combined efforts of all of us, both on and off the job, can we expect to see any meaningful gains made in overcoming the inequalities of our time.

David Packard



Down to earth study of the moon

Still trying to catch up with Dick Tracy, scientists are discovering new methods of studying the lunar landscape in preparation for manned expeditions. Shown here is a picture of a portion of the Surveyor moonship as reconstructed on an HP Model 1300 X-Y monitor from a magnetic tape on which the digitized image was stored. University of Southern California graduate students David Ketchum, left, and Harry Andrews borrowed the tape from Pasadena's Jet Propulsion Laboratory which designed the Surveyor project. Actually, the students wanted the tape not for its moon data but as an aid in studies of image coding, computer techniques and graphic display systems. The Model 1300 with its 8 x 10-inch CRT screen, proved ideal for their purposes — as it is in a number of applications where enlarged display of an image is important for group study and instruction.

Measure

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